CITY OF LINCOLN/LANCASTER COUNTY
GIS VISIONING REVIEW
TECHNICAL MEMORANDUM

Submitted to:

LLC GIS Committee, GIS Master Plan Project Team

Submitted by:

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SECTION 1
BACKGROUND AND PURPOSE OF MEMORANDUM

In October 2003, the GIS Committee and other key City and County GIS users participated in a GIS Visioning Workshop facilitated by Environmental Systems Research Institute (ESRI). The purpose of this workshop was to develop a vision for GIS development that would result in an enterprise approach to GIS. From this workshop came the following recommendations:

1. Formalize the GIS implementation.

2. Create a more structured GIS organization.

3. Further refine the Vision Statement: "Connecting More than the Dots."

4. Initiate and implement the following major application and core database development efforts:

    a. Develop a *GIS Master Plan*

    b. Unify the development of land base data

    c. Inventory infrastructure and develop database

    d. Formalize a process for workflow management

    e. Improve GAS and CAD (Computer Aided Design) integration

    f. Establish a GIS training program for continuing education.

5. Incrementally develop "quick-win" GIS applications.

Subsequent to the Visioning Workshop, the GIS Committee took action on several of these recommendations. This was done through the initiation of two projects—1) a technology migration strategy project with ESRI, and 2) a *GIS Master Plan* development project with PlanGraphics.

The technology migration strategy project was conducted first. During this project, geospatial resources and uses were captured (more info – look at strategy document).

After the migration strategy was developed, the GIS master planning process began. Initial tasks in the master planning project included the review of work done to date, development of questionnaires to collect additional data, and an assessment of whether the recommendations of the *Visioning Report* were still valid and should be implemented against. From that work, the *GIS Master Plan* will be developed. This technical memorandum compares the existing conditions and sentiments in the participating

agencies with the enterprise vision as previously presented and answers the following question:

"Does the current Enterprise GIS development make sense?"

This document has been organized into several sections in order to answer that question. Section 1, Introduction, provides the project background and a purpose for the memorandum. Section 2 reviews each of the recommendations. Finally, Section 3 provides a summary of issues critical to the implementation of the enterprise GIS.

SECTION 2
EVALUATION OF THE VISIONING REPORT

In this section of the Technical Memorandum, PlanGraphics evaluates the recommendations of the visioning report to answer the following questions posed by the project team:

> Based on the current *Enterprise GIS Vision* document, is the model proposed still feasible? Is it up-to-date? What departments supported the vision? Which didn't? What is the status of some of the major developments? Does a formal data warehouse exist?

Each recommendation is reviewed below.

FORMALIZE GIS IMPLEMENTATION

All master planning project participants indicated a need for a more structured approach to GIS that would allow them to receive increased benefits. Most of the agencies participating in the project are currently using GIS or other spatial technologies routinely in the performance of their jobs. While they have already seen the positive impacts on work performance that GIS can have, a more formalized and enterprise approach is necessary.

Some of the primary objectives in formalizing an enterprise GIS implementation include:

- Development of GIS standards
- Development of metadata
- Allows agencies to anticipate, plan for, and execute upward migration of technology, i.e., AMLs and Avenue scripts
- Supports cost-effective purchasing
- Provides help desk and technical support to end users at all skill levels
- Streamlines workflows
- Encourages collaboration and efficiencies
- Supports end-user training
- Definition of roles and responsibilities

- Identification of funding and other resources
- Creation of an executive-level understanding of GIS and financial support for the program.

Although a more structured approach is desired, some departments expressed concern that the structure not be too centralized or rigid. Several were quite firm in their belief that the enterprise GIS should not become a centralized department but should remain collaborative with a more coordinated approach.

CREATE A MORE STRUCTURED GIS ORGANIZATION

Opinions varied widely on how the enterprise GIS should be structured. However, nearly all felt that there is a compelling need for centralized management that would support the GIS implementation. Because of the "islands of GIS" that currently exist, the new approach should be an organic structure that pulls people together.

Participants agreed on the need to have a coordinator who would provide leadership and guidance to the program. A committee should guide the work performed by this coordinator. Some felt the existing committee should be expanded to be more inclusive and that the expanded committee would provide that guidance. Participants strongly indicated that technical committees should be established to support the guidance committee and the GIS coordinator.

Overall, most participants felt that a more structured GIS organization needs to be formed. However, several groups expressed strong resistance to the creation of a centralized GIS department. The new structure should take fuller advantage of existing intergovernmental agreements and should initiate others as necessary. Overall management of GIS should be City/County neutral. Therefore, the GIS Coordinator and any staff supporting that coordinator should be accountable to the committee, not to a city or county department.

The coordinator and any other staffing assigned by the committee should provide technical support to end users at all levels. This includes help desk support, mentoring, and other technical assistance. They should also facilitate software and application training.

Funding was a key concern in developing a more structured GIS organization. Overall, City staff felt that they would have a difficult time justifying additional costs to executive management, whereas County departments thought that they could rally support and obtain additional financing where necessary.

FURTHER REFINE THE VISION STATEMENT: "CONNECTING MORE THAN THE DOTS"

The *Visioning Report* suggests that the vision statement may require refinement as the enterprise GIS implementation develops. None of the *Master Plan* project participants indicated the need to change the vision statement at this time. However, the vision statement was not commonly verbalized during interviews and may not yet be associated with GIS program development. As marketing for the GIS program develops, the vision statement should be incorporated to illustrate to governmental executives the value of GIS.

INITIATE AND IMPLEMENT SEVERAL MAJOR GIS PROGRAM COMPONENTS

Develop a GIS Master Plan

This technical memorandum is part of the *GIS Master Plan* project. Interview participants were enthusiastic about the project and anxious for a *Master Plan* to be developed.

Unify the Development of Land Base Data

The development of land base data was a critical issue for most of the master planning participants. However, issues varied from department to department, and complete unification of the land base data poses some challenges. Land base data is developed by several different agencies in the City and the County. The County Engineer and Assessor have developed much of the land base as survey grade data. However, this development is laborious and incomplete. As a result, other departments, such as Public Works, have developed other land base sets to give them a fabric on which to map infrastructure.

The majority of City GIS users are in fact that – users of the data. In general, most users only require mapping grade data. They also need GIS functions and capabilities provided by current releases of ArcGIS. A strong overall sense exists that migration to the geodatabase is needed for the enterprise land base.

This poses concerns for the County Engineer, Assessor and others. The current version of ArcGIS does not support the data precision that has been created by the County Engineer with previous versions of ArcInfo. Therefore, concerns exist that land base accuracy will be degraded by migrating it completely to the geodatabase. It will be necessary to utilize ESRI's Survey Analyst in order to maintain the land base with the current precision. This poses its own concerns due to the complexity of the software and the resultant need for training in the product.

Despite these challenges, unified land base development was expressed as an overwhelming need. Users find it difficult to identify which spatial data set to use. Data currency is also a critical issue. Refining the workflows associated with land base development and maintenance will be a critical implementation task.

Inventory Infrastructure and Develop Database

Some participants felt that not all GIS users were willing to share their data. However, no participants expressed any reluctance to share data except where security is an issue. The disconnect appears to be in the vast quantities of undocumented data and lack of formal rules for posting and sharing data.

Database development for enterprise data is still a critical implementation issue for the enterprise GIS. As part of the technology migration strategy project, ESRI catalogued data sets used by numerous City and County departments. PlanGraphics expanded that project during its surveys, and the results were loaded into an Access database. The results of these two efforts should be used as a starting point for database design and development during implementation.

Formalize a Process for Workflow Management

Several intergovernmental or interdepartmental workflows require streamlining. The most obvious is the development and maintenance of land base data. Another is the assignment of addressing to geospatial features, i.e., points and centerlines.

While participants did not verbalize a need for a formal process for workflow management during the interviews, it would still be beneficial to have standard procedures to guide the City and County through the re-engineering process.

Improve GIS and CAD (Computer Aided Design) Integration

The need for enhanced GIS and CAD integration continues to be a critical implementation issue. Streamlining data maintenance procedures and the plat review process will rely on digital submission standards that result in GIS-ready data. Digital submission standards have been drafted and are being refined. Finalizing these standards is a critical issue, particularly for Planning. The use of GIS and CAD tools also needs to be defined, particularly in Public Works where MicroStation is used primarily for GIS functions.

Enhancing the integration of GIS and CAD is also a critical issue in the development of a unified land base management approach. By retaining and integrating the more precise MicroStation with geodatabase development, all users can experience the benefits desired.

Establish a GIS Training Program for Continuing Education

Universally, participants identified the need for a GIS training program. Most of the users are self-taught. The one definitive exception to this is the Police Department where industry specific training is provided to officers as part of other training efforts.

INCREMENTALLY DEVELOP "QUICK-WIN" APPLICATIONS

Master planning participants identified numerous applications currently in use and to be developed in the future. These applications are being documented and described in the *Master Plan*. The *Master Plan* will also describe the recommended prioritization of application development during implementation. This will provide the incremental development recommended by the *Visioning Report*.

SECTION 3
SUMMARY AND RECOMMENDATIONS

The City of Lincoln and Lancaster County departments have a longstanding tradition of collaborating and working together. Consistently, they, as well as other participants, support the vision for an enterprise GIS. Their combined views on how that vision should be implemented have resulted in the following recommendations. These recommendations have been formulated to answer questions posed by the *Master Planning RFP*.

RECOMMENDATION 1: CREATE A GIS PROGRAM MANAGEMENT OFFICE

There are as many ways to implement an effective GIS program as there are organizations that are implementing GIS technology. The development of a multi-participant enterprise GIS program generally consists of several key structural components. These include:

- Binding agreements between parties which define commitments
- Creation or assignment of staff to a centralized management and support team
- Location of that team in one of the member organizations for administrative support.

At the City of Lincoln/Lancaster County, all master planning participants strongly expressed the need for a GIS coordinator who would act on the direction provided by the GIS Committee. Everyone had very large expectations for what this role would provide.

The successful implementation of an enterprise GIS program requires that numerous GIS projects be conducted simultaneously. Some of those projects may have interdependencies. The GIS program coordinator should identify teams for the projects, monitor the progress of the teams, manage the interdependencies, and participate in project teams.

In addition to direct implementation support, master-planning participants identified other key areas that need to have centralized management and support. A training plan needs to be developed and implemented. Help desk support should be provided. This individual would also handle management of GIS funds.

Because the roles identified were broad, it is unrealistic for one person to effectively guide the implementation strategy being designed in the *Master Plan*. We are not recommending that a GIS Department be created. Rather, we are recommending that the GIS Committee create a GIS Program Management Office. The GIS Program Management Office would be headed by a GIS coordinator and may include a technical

resource to support the overall program. This approach will provide neutral and centralized coordination for the GIS program. However, it will be limited to only those few resources that are required for that coordination and collaboration.

After further discussion, the general consensus was to create a GIS Management Office in Planning. One full-time position should be allocated to hire a GIS coordinator. Interlocal agreements should be used to establish participation, roles and responsibilities, and cost sharing. Additional staffing will likely be necessary. The GIS coordinator should be hired first by the Committee. This coordinator should be involved in the selection of any additional staff.

RECOMMENDATION 2: EXTEND REACH OF EXISTING GIS COMMITTEE

We recommend that the standing GIS Committee explore ways to extend its reach to other city and county departments. The Committee is currently comprised of the agencies who have been the primary data creators and implementors of the present GIS program. While we believe this Committee ought to remain the near-term administrative focus of the program, the Committee should research additional means for involving other city and county departments in the continuing evolution of the City-County GIS program.

One means to consider is potentially expanding the GIS Committee's membership to include departments that elect to take a more active role in creating and maintaining commonly accessed databases, in sharing in the cost of the program, in enhancing their technical proficiency in GIS, and in furthering their department's overall use of GIS in day-to-day operations.

Another way of extending the GIS Committee is to create a Technical Committee. This Committee would be related to the GIS Committee but would have primarily a technical focus rather than a business focus as decisions are being made.

A third way to increase involvement is through the creation of data and application licensing agreements. Parties that wish to use the data but not necessarily influence the strategic direction of the GIS program can become participants through licensing agreements. This opportunity may rely upon proposed changes in Nebraska law. Continued monitoring of Nebraska Legislative Bills LB490 and LB565 is recommended.

Lastly, an active GIS User Group should be created that supports and educates end users. This would also offer end users a venue to make suggestions that could be taken to the GIS Committee or Technical Committee. The GIS User Group would be guided by the GIS Program Management Office to ensure that topics pertinent to the implementation are being presented – and that the implementation issues of the end users are identified quickly.

Funding is a key concern of many City and County participants. However, blocks of funding have traditionally been set aside for specific GIS endeavors such as acquisition of aerial photography. Funds are annually committed and should continue to be. Following this model, contributions should also be sought from other governmental departments or companies that could benefit from the enterprise GIS. At least one of the participants indicated that they could justify additional funding for GIS program enhancements.

We also recommend that the City grant writer be consulted on potential funding. A number of homeland security grants have included provisions for the development of geospatial data and applications. Lincoln/Lancaster County has a very successful GIS implementation in its Police Department and Sheriff's Office and may not have considered this as a potential revenue stream.

Because we have not recommended the formation of a GIS Department but rather a Program Management Office, we would also suggest that the view of "funding" the program be expanded. While some departments may have difficulty in identifying any more fiscal resources to assign to GIS implementation, they could have one or more of the following resources to commit:

1. Staff time. Labor hours that staff work on enterprise GIS implementation.

2. Space. This could be office space for the Program Management Office, labs for training, or another space where project-specific work could be conducted.

3. Applications/Re-usable code. Several departments have written their own scripts and may be able to contribute re-useable code.

4. Success templates. These could include training documents or intradepartmental procedures that have been successful and can be reused.

5. Equipment. This could include devices such as GPS equipment that may not be used constantly by the owner and can be "rented out" for enterprise use.

All of these resources have a financial value that could be assigned, and budgets could be assigned for these resources just as they are for fiscal resources. For example, the Assessor's office suggested it has a couple of individuals who could work on enterprise data development on a part-time basis. That might result in a budgeting commitment of one FTE for the program. The staff stays in their organizations. Their time is coordinated by the Program Management Office with the department that commits the resource to the Office's "budget."

RECOMMENDATION 3: DEVELOP AND IMPLEMENT A COMMUNICATION/EDUCATION PLAN

Executive support for the program is key to acquiring any additional funding for the GIS program. Our final recommendation from our review of the *Visioning Report* is that a marketing plan be developed that educates City and County directors about the values of GIS in the business of local government. The *GIS Master Plan* will include an analysis of the Return On Investment. This should be used as an element of the marketing plan. Presentations to local government executives have also been included in the scope of work for the *Master Plan*. However, this will need to be an ongoing responsibility of the owners of the GIS program. As such, the GIS coordinator should manage marketing endeavors in cooperation with the GIS Committee and User Group.